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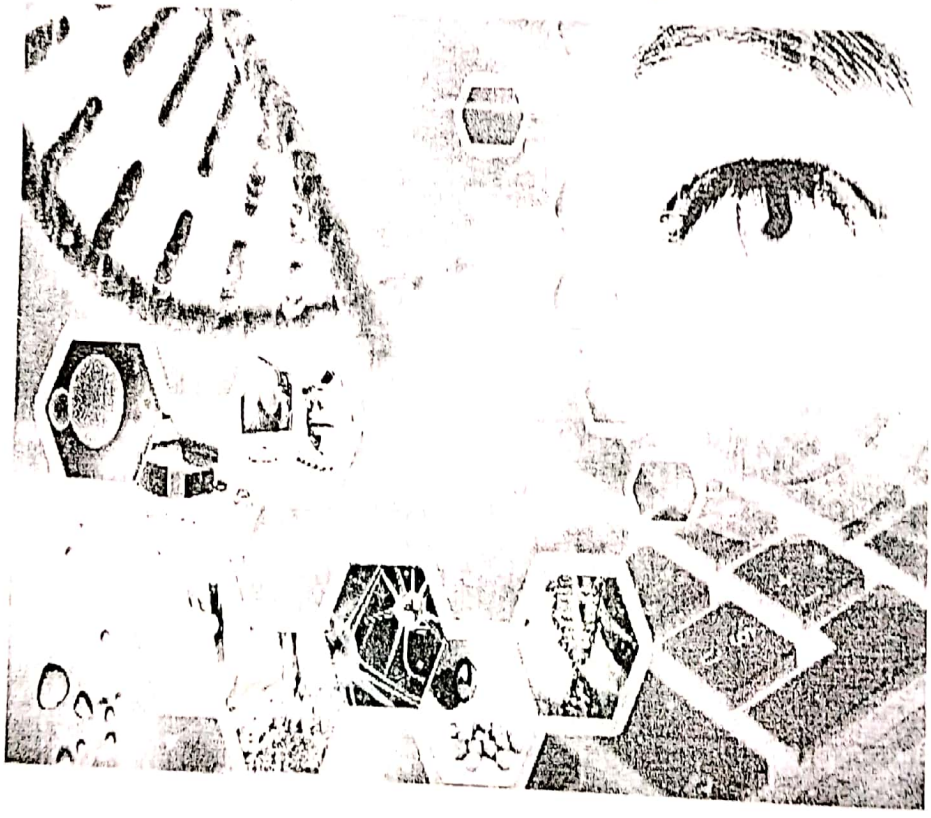

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Content

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STUDY OF SOME PHYSICO-CHEMICAL ASPECTS OF POND WATER AT NAGOTHANE DIST.RAIGAD. (M.S.), INDIA

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ABSTRACT

In this study area, plenty of water sources are available for all type of human activities like industrialization, agriculture, fishing, domestic purpose etc. Out of these sources, Pond water is also used by some of the peoples residing in this area for drinking and different domestic purposes.Present investigation was carried out in the year 2017-18by taking water samples from four pond sites at Nagothane Dist. Raigad. The water samples were collected and analyzed for its some physic-chemical properties such as pH, Temperature, Conductance, Alkalinity, TH, Turbidity, TDS, etc. The results obtained from the samples were complied with BIS and it shows that Alkalinity and TDS were above the permissible limit and other parameters were in below the standard limits. This work would be useful to find out remedies and develop strategies that would reduce contamination of water and maintain the quality of water for drinking as well as domestic purposes.

KEY WORDS – *Physico-chemical properties, Contamination, Pond water,BIS,Nagothane.*

INTRODUCTION

Hydrosphere is one of the most important segments of the environment. It includes all types of water i.e. surface water, groundwater, oceans, rivers, lakes, ponds etc. Water is essential to all kinds of life. Water anyone turns on the faucet, water is expected to flow from it night or day, summer or winter, whether one fills a glass to drink or attempts to water the lawn. It is supposed to be clean, odor free & safe for human consumption. Water is truly an amazing substance and yet it is so mundane that we seldom are really aware of its presence, it has vital role in life processes, and the importance of its characteristics. The very presence of water on earth is unique phenomenon and it appears to be a rare substance in our overall planetary system. It is water vapor that potentiates life on earth the earth and its atmosphere are composed of wide variety of natural solids and gaseous substances but there are very few natural liquids such as water [8,9].This investigation was carried out for some pond water at Nagothane, Taluka -RohaDist. Raigad. Hydrosphere is one of the most important segments of the environment.

II. MATERIAL AND METHODS

The present study has been carried out for study of some pond waterat Nagothane, Dist. Raigad. In the study area of Nagothane four ponds sampling sites were selected i.e. named as PW1, PW2, PW3and PW4. (P=Pond W= Water).Parameter such as pH, temperature, DO and TDS were analyzed on the site itself. The samples were brought to the laboratory for analysis. All efforts were made to follow the standard methods for collection, preservation and analysis of samples [4, 6, 10, and 13].

III. RESULT AND DISCUSION

The variations in analysed physical and chemical characteristics are tabulated in table number 1 & 2.

Table No.1:-Seasonal variations in Physicochemical Parameters of the Pond water at Nagothane (2017-18).

Sample No.	Temperature °c			pH			Conductivity (μ mho/cm)			Turbidity in NTU		
	S	R	W	S	R	W	S	R	W	S	R	W
PW1	26.8	26.1	25.4	7.8	7.6	7.4	390	245	360	15	28	12
PW2	26.9	26.2	25.3	7.3	7.5	7.3	395	230	355	12	30	10
PW3	26.7	26.0	25.8	7.1	7.3	7.5	400	235	350	15	35	18
PW4	26.8	26.3	25.2	7.2	7.2	7.8	385	265	345	16	32	20

S=Summer Season, R=Rainy Season and W=Winter season

Table No.2:-Seasonal variations in Physicochemical Parameters of the Pond water at Nagothane (2017-18).

Sample No.	Total dissolved solids mg/l			Total Alkalinity in mg/lit			Total Hardness mg/lit		
	S	R	W	S	R	W	S	R	W
PW1	352	300	320	120	90	78	60	55	50
PW2	359	315	325	125	85	75	65	60	55
PW3	358	320	322	110	95	80	68	65	50
PW4	355	330	335	120	90	85	66	62	52

S=Summer Season, R=Rainy Season and W=Winter season

Temperature- In the present investigation the range of temperature of water during summer was found to be in between 26.7 ^{0}c (PW3) to 26.9^{0}c (PW2), in rainy season 26.0^{0}c (PW3) to 26.3 ^{0}c (PW4) and in winter 25.2^{0}c (PW4) to 25.8^{0}c (PW). At higher temperature solubility of oxygen and other gases decreases and water becomes tasteless while metabolic activity of organism increases. Temperature had an appreciable effect on dissolved oxygen and biochemical oxygen demand and the aquatic organism in water [11].

pH- pH is the measurement of free acidity or alkalinity of water solution, hence it is an important factor for water analysis. In the present investigation the range of pH of water during summer was found to be in between 7.1 (PW3) to 7.8 (PW1), in rainy season 7.2 (PW4) to 7.6 (PW1) and in winter 7.3 (PW2) to 7.8 (PW4). The maximum pH values were recorded in summer months and minimum in winter season and slight increase in rainy season months. The changes in pH together with conductivity of water body indicate the presence of certain pollutants [3].

Conductivity-During summer season it was found to be in between 385 (PW4) to 400 (PW3), in rainy season 230 (PW2) to 265 (PW4) and in winter 345 (PW4) to 360 (PW1). It is showing large measure of soluble ions which is confirmed by the presence of other metals and chlorides as well as other parameters. However the average conductivity is within the permissible limit.

Turbidity- In the present investigation the range of turbidity was in between 12 (PW2) to 16 (PW4) in summer, in rainy season 28 (PW1) to 35(PW3) and in winter 10 (PW2) to 20 (PW4) NTU units. Lowest values

were in winter months and highest in rainy season months. Higher turbidity affects the life indirectly b cutting the light to be utilized by the phytoplankton growth.

TDS- Total dissolved solids were recorded in the range between 352 (PW1) to 359 (PW2)in summer, in rain season 315 (PW2) to 330 (PW4) and in winter 320 (PW1) to 335(PW4).The minimum values were recorde during rainy season and maximum in summer months. The TDS values were below the drinking wate standards prescribed by WHO [14]. Similar results were also observed by [7]. TDS conductivity and Turbidi are positively related with each other [12].

Total Alkalinity:- The alkalinity of natural water is due to the salts of carbonate, bicarbonates, silicates an phosphates along with hydroxyl ions, whereas acidity of water means is quantitative capacity to react wit strong base to a designed pH. Strong mineral acids, weak acids and hydrolyzing salts such as iron o aluminum sulphate may give acidity to water. In the present investigation the range of alkalinity was foun to be varied between 110 (PW3) to 125 (PW2) in summer, in rainy season 85 (PW2) to 95 (PW3) and s winter 75 (PW2) to 85 (PW4) mg/l. The pH water was found to have alkaline trend. This might be due t increase in carbonate alkalinity and cleaning activities [2]. observed bicarbonate alkalinity is mainl responsible for higher values.

Total Hardness-It is a measure of capacity to precipitate soap. It is the sum of the polyvalent cations preser in water. It is varied in between 65 (PW2) to 68 (PW3) in summer, in rainy season 55 (PW1) to 65 (PW3) an in winter 50 (PW1& PW3) to 48.8 (PW2). The ions such as calcium and magnesium in combination wit bicarbonates, carbonates, sulphide, sulphates and other anions make the water hard. Hard waters ar believed to be more productive than soft waters. Hard waters may also create problems to human healt causing gastritis [1].Hardness of water effects on health of human being.

IV. CONCLUSION:-

There is an indication from the above result that the concentration of some parameters in the pon water is increasing over a period of time. All the values obtained are within the maximum permissible lim However proper control measures to be taken to prevent further degradation of water and load on th water treatment process. People from this area should drink water only after treatment process.

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